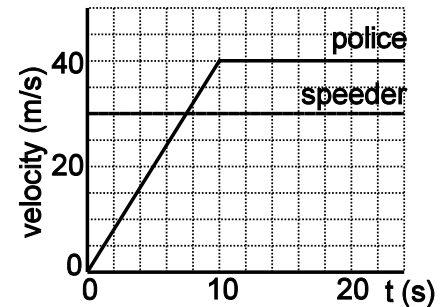


Answer the following questions. Watch your precision & accuracy & be sure to show all your work!

- A ball starts to roll up a slope with a velocity of 5.0 m/s and comes to a stop after rolling 5.0 m up the slope. Assume the acceleration was uniform.
  - What was the rate of acceleration of the ball on the slope? {2.5 m/s<sup>2</sup>[d]}
  - How long did the ball roll up the slope? {2.0 s}
- A stone is dropped down a well and strikes the bottom of the well 4.0 s later.
  - How deep is the well? {80 m[d]}
  - What was the velocity of the stone when it hit the bottom? {40 m/s[d]}
  - How far did the stone fall in the last second? {35 m[d]}
- A woman jogs 200 m at 10 m/s[fwd] and then slows down and jogs at 5.0 m/s[fwd] for 10.0 seconds. What is her average velocity? {8.3 m/s[f]}
- The graph to the right shows the velocity of two vehicles as a function of time.
  - Describe, using times and velocities, what is happening.
  - What is the displacement for each of the vehicles at 10 s? {300 m[f], 200 m[f]}
  - How far apart are the two vehicles at 10 s? {100 m[f]}
  - At what time will the police cruiser pass the speeder? {20 s}



- A plane flying a triangular pattern flies 150 km[N], then 400 km[E].
  - What is the total displacement of the plane after these two legs? {427 km[N69°E]}
  - What third displacement would complete the trip back to the starting point? {427 km[S69°W]}
- A fishing boat leaves port at 04:30 h in search of the day's catch. The boat travels 4.50 km[E], then 2.50 km[S], and finally 1.50 km[W] before discovering a large school of fish on the sonar screen at 06:30 h.
  - Calculate the boat's average speed. {4.25 km/h}
  - Calculate the boat's average velocity. {1.95 km/h[S50°E]}
- A ball rolling with an initial velocity of 40 m/s[W] undergoes an acceleration of 5.0 m/s<sup>2</sup>[N] for a period of 6.0 seconds.
  - What is the final velocity of the ball? {50 m/s[W37°N]}
  - What is the displacement of the ball in the 6.0 s? {260 m[W21°N]}
- A car, moving initially at 32 km/h[N], turns a corner and continues at 32 km/h[W]. If the turn takes 3.0 s to complete, find:
  - the change in velocity. (Hint:  $\Delta \vec{v} = \vec{v}_2 - \vec{v}_1$ ) {45 km/h[SW]}
  - the average acceleration during the turn. {15 km/h/s[SW]}
- An airplane flying at a constant speed of 1000 km/h executes a slow, level turn that changes its direction from west to east. If the turn takes 80 s, calculate the plane's average acceleration. {25 km/h/s[E]}
- Ken and Bill are standing together. Ken walks 10 m[N] and then 15 m[W]. Bill walks 25 m[E] and then 30 m[S]. What is the displacement from Ken to Bill? {57 m[SE]}